CHM-A level

A2:   Data Communication and Computer networks (Duration 75 Hours)

Subject Prerequisites:
Basic understanding of computers networks and Internet

Subject Outcome:
Subject contents are designed with an intention to provide details of various networking aspects such as data communication, multichannel communication, recent trends in networking and network services along with recent threats in and security paradigm.

Section	Brief Contents	Duration (Hrs)
1. Basic of Data communication and transmission medias	What is data communication, Need of data communication, transmission modes, synchronous and asynchronous transmission, guided and unguided media role of types of networks in data communication, how data communication differs in various networks i. e. LAN, MAN, WAN. Working methodology of Transmission mediums (wired & wireless). Data loss reasons and solutions.	5
2. Multichannel data communication	Introduction to multiplexing (FDM, TDM, CDM, WDM), Access techniques (FDMA, TDMA, CDMA etc), SONET - DWDM -Fiber to the Home - DSL - CATV - ISDN – Broadband ISDN. Internetworking with ATM, Multiprotocol over ATM.	8
3. Internet architecture, DNS and in-depth Protocol study	Working model/architecture of Internet, Working of Communication Protocols(TCP, UDP, ICMP, DHCP, HTTP, POP, FTP, IMAP etc), Understanding TCP/IP at actual, how DNS works, types of DNS, understanding open DNS and managed DNS.	7
4. In-depth Network services	Understanding NIC cards, MAC ID, IP (Static, Dynamic, internal, public) in Internet and mobile Networks cards, video on demand, video telephony, 4G services	6
5. Advanced trends in networking	Mobile Communications technologies, Network design, Bluetooth technology , threats in Bluetooth technology, Optical Networks, VoIP, Advanced intelligent Networks. cloud networking concepts, detailed IPv6	9
6. Network threats and Advanced Network security	Data protection, cryptography application in networks, barriers to effective security, DNS security, Security in E-commerce and E-governance.	5

List of Experiments	1. Installation of Network card, altering MAC address and revealing original MAC.	35
	2. Working with LAN connection, terminal connection and remote LAN connection	
	3. Working with various access point devices	
	4. Understanding data loss issues and preventive measures	
	5. Working with various types of DNS	
	6. Understanding various types of IP's (static, dynamic, internal, public)	
	7. Demonstrating threats in Bluetooth technology	
	8. Working with IPv6 addressing	
	9. Applying cryptography in networks	
	10. IP configuration and IP masking	
	11. Installing Wi-Fi network and understanding Wi-Fi ranges and limitation	
	12. Understanding firewall/IDS/IPS logs	
	13. Working and troubleshooting Video teleconferencing devices	
	14. Working and troubleshooting VOIP	
	15. Implementation of security features in E-commerce/E-tendering	